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This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An image processing method for extracting a thread-like structure represented within a digital noisy original image, comprising steps of:

acquiring the original image data;

extracting pixel strings of a threadlike structure within the original image data, ~~wherein the phase operation is based on detecting a relative intensity of pixels in a neighborhood of pixels in the digital noisy original image~~; and

conducting a Phase operation in order to automatically generate one Best String from the pixel strings for representing the threadlike structure, wherein the Phase operation is based on detecting a relative intensity of pixels in a neighborhood of pixels in the digital noisy original image.

2. (previously presented) An image processing method as set forth in Claim 1, wherein the step of conducting a Phase operation includes the steps of:

first forming a String Set with the pixel strings;

second forming a set of Candidate Paths linking couples of End-Points of the pixel strings within said string set; and

selecting one Best Candidate Path as the Best String within the String Set.

3. (previously presented) An image processing method as set forth in Claim 2, wherein the step of conducting a Phase operation further includes steps of:

generating a set of Candidate Paths from which the best string is selected by implementing a Front Propagation operation upon the couples of End-Points of the pixel strings inside the said String Set.

4. (previously presented) An image processing method as set forth in Claim 1, wherein the step of conducting a Phase operation includes steps of:

- 2 -

determining adjacent couples of pixel strings having opposite End-points,

forming sets of Connection Paths outside the pixel strings,

linking the opposite End Points of said adjacent couples,

selecting respective Best Connection Paths for linking the couples of pixel strings, and

forming one Best String from the linked pixel strings.

5. (previously presented) An image processing method as set forth in Claim 4, wherein the step of conducting a Phase operation further includes steps of:

generating sets of connection paths using a Front Propagation operation, which front propagation operation operates upon the couples of opposite End-Points of the pixel strings, outside the pixel strings, and

utilizing the sets of Connection Paths to select the Best Connection Paths.

6. (currently amended) An image processing method as set forth in Claim 1, further comprising steps of:

extracting elementary pixel strings associated in string sets deriving from the same threadlike structure;

conducting a [[a]] First Phase operation which automatically generates one Best String per string set, wherein said Best String represents the threadlike structure.

7. (previously presented) An image processing method as set forth in Claim 6, further comprising the step of:

conducting a Second Phase operation by linking Best Strings to automatically generate one Final Best String, which final best string represents the threadlike structure.

8. (previously presented) An image processing method as set forth in Claim 6, wherein the step of conducting the First Phase operation includes the steps of:

- 3 -

first forming, inside a considered string set, couples of End-Points of elementary strings,

second forming set of Candidate Paths linking said couples of End-Points, and

selecting one Best Candidate Path as the Best String.

9. (previously presented) An image processing method as set forth in Claim 8, wherein the step of conducting the First Phase operation further includes the step of:

conducting a Front Propagation operation between the couples of End-Points of the elementary strings inside a considered String Set in order to generate a set of Candidate Paths from which the Best String is selected.

10. (currently amended) An image processing method as set forth claimed in claim [[6]] 7, wherein the step of conducting the Second Phase operation further includes the steps of:

first forming couples of Best Strings outside each string set by using couples of opposite End-Points of said couples,

second forming sets of Connection Paths linking said opposite End Points, and

selecting one Best Connection Path for linking each couple of Best Strings and one Final Best String among the Best Strings connected by the Connection Paths.

11. (currently amended) An image processing method as set forth in Claim 10, wherein the step of conducting the Second Phase includes the further steps of:

conducting a Front Propagation operation between said opposite couples of End-Points of the Best Strings outside the String Sets in order to generate the sets of Connection Paths, from which the the Best Connection Paths are selected.

12. (previously presented) An image processing method as set forth in Claim 6, wherein the step of conducting a first phase operation includes that, prior to the implementing the

- 4 -

first phase operation, a step of calculating a ridgeness calculation to form a ridgeness data image including ridge pixels showing an intensity gradient that is maximum in a first determined direction in its neighborhood, and showing a lower intensity gradient in a direction perpendicular to said first direction, such that the greater the number of pixels that verify the gradient property are found in the formed image structure, the higher the ridgeness measure of the image structure.

13. (previously presented) An image processing method as set forth in Claim 12, further comprising the steps of:

first generating First Potential Image from the ridgeness data image, where the potentials of the pixels derived from the considered string set are set to first values, which first values are lower than a given predetermined value, the potentials of pixels of the other string sets are set to second values, which second values are higher than said predetermined value, and the pixels located outside the string sets are attributed potentials whose values are function of their ridgeness data values,

second generating a Front Propagation operation for propagating the lower potentials in the First Potential Image, and

forming the Candidate Paths between couples of End-Points of the elementary strings.

14. (previously presented) An image processing method as set forth in Claim 6, further comprising steps of:

determining the opposite End-Points of couples of Best Strings,

forming a Second Potential Image from the Best String image, wherein all the string pixels are attributed potentials, which are higher than a given predetermined potential value, and the other pixels are attributed potentials, which are lower than the given predetermined potential value,

conducting a Front Propagation operation for propagating the lower potentials in the Second Potential Image, and

- 5 -

forming the Connection Paths between couples of opposite End-Points of the couples of Best Strings.

15. (currently amended) An image processing method as set forth in Claim 6, wherein the ~~selection~~ phase operation ~~of the Intra-set and Extra-Set Phases are~~ is conducted in accordance with the height of ridgeness of the structures of the Paths.

16. (previously presented) A system comprising a suitably programmed computer or a special purpose processor having circuit means, which circuit means are arranged to process image data according to the method set forth in claim 1.

17. (previously presented) An examination apparatus comprising:

    means for acquiring medical digital image data, and

    a system having access to said medical digital image data for carrying out a processing method as set forth in Claim 1, and

    display means for displaying the medical digital images and the processed medical digital images.

18. (Currently Amended) A ~~computer program product comprising a~~ computer-readable medium~~, said product comprising a set of instructions for carrying out a method as~~ for performing the steps set forth in claim 1.

- 6 -